RESEARCH PROGRESS REPORT SUMMARY

Grant 02692-A: Diagnostic Accuracy of Point of Care Analysis of Canine Urine and Plasma in Marijuana Toxicosis

Principal Investigator:	Joel Weltman, DVM
Research Institution:	Caspary Research Institute of the Animal Medical Center
Grant Amount:	$14,450
Start Date: 2/1/2020	**End Date:** 7/31/2021
Progress Report:	FINAL
Report Due: 7/31/2021	**Report Received:** 9/21/2021

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Original Project Description:

Given the increase in availability of marijuana in the United States, a higher number of presumed marijuana exposures have been reported in veterinary emergency clinics. Since the clinical signs of marijuana ingestion are non-specific and may be observed in several disorders, an accurate canine bedside diagnostic test may alleviate the need for expensive and invasive diagnostic procedures in canine patients. To date, no studies have evaluated the accuracy of urine drug screening tests using non-invasive urine or blood samples in dogs. The purpose of this study is to determine the best method to diagnose marijuana toxicity in dogs in a point of care emergency setting.

Publications:

Denroche K, Bischoff K, Weltman J. Evaluation of the diagnostic accuracy of point of care urine tests in marijuana toxicosis in dogs, manuscript in preparation.

Presentations:

Denroche, K. Did that Dobie eat a Doobie? Evaluation of point of care urine tests in marijuana toxicosis in dogs. Resident Research Symposium, July 2021.

Weltman J. How to establish THC toxicosis in the emergency room. VetVine, recorded October, 2021. http://bit.ly/CHF_THC

Report to Grant Sponsor from Investigator:

Between February 2019 and March 2020, 56 dogs were enrolled in the study. The amount of Δ9-tetrohydrocannabinol (THC) ingested was available for eight dogs (14%). The average dose ingested for those dogs was 175 mg (range 35-4,400). Types of sources reported included both commercial and homemade edible products (15), marijuana plant material (3), and commercial THC concentrate (1). The time since ingestion to arrival at the hospital was known for 12 dogs, with a median presentation time of two hours and a range of forty minutes to six hours.

Similar to previous reports, the most common clinical signs included an inappropriate level of alertness, poorly coordinated gait, and exaggerated responses to visual and auditory stimuli. Of the 56 dogs enrolled in the study, 55 (98%) tested positive for THC in plasma by liquid chromatography/mass spectrometry. Eighteen dogs (32%) tested positive using the Alere drug screening test and 26 dogs (46%) tested positive using the Narcocheck drug screening test. All animals that tested positive using the Alere test also tested positive on the Narcocheck test. Calculation of sensitivity for both the Alere and Narcocheck drug screening tests was performed on the 55 dogs testing positive via LC-MS demonstrating values of 33% and 47% respectively.

This study highlights the shortcomings of point of care urine drug screening systems in the diagnosis of acute THC exposure in dogs. Potential causes for a low sensitivity may include timing, the substances the screening test identify in the urine, and patient factors including level of hydration and urine concentrating ability. This study does support the use of history and clinical examination in identifying animals with THC exposure. Future analyses of THC substances in dog urine may provide a more ideal point of care diagnostic test that targets metabolites that concentrate in dog urine following acute THC intoxication.